

NATURE INCORPORATED

INDUSTRIALIZATION AND
THE WATERS OF NEW ENGLAND

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INTRODUCTION

In the summer of 1839, Henry David Thoreau and his brother John prepared to leave Concord, Massachusetts, on a two-week holiday. Earlier that spring, Henry had built a fifteen-foot boat – flat bottomed, narrow, with a sharp prow – which he painted blue and green and christened the *Musketaquid*, the Indian name for the Concord River. The Thoreau brothers loaded the boat with their camping gear: a lantern, kettle, rice, sugar, bread, cocoa, and some potatoes and melons they had grown themselves. They packed a cotton cloth to use as a tent or sail, two buffalo skins for sleeping, and an extra blanket. They also brought along a gazetteer to guide them in their wanderings, to flesh out the landscape that would soon unfold before them. As dreary morning gave way to mild afternoon, they launched their boat into the Concord River and began what turned out to be a special journey, a trip that took them through New England and brought them close to the soul of the land.¹

The Thoreau brothers headed for the White Mountains, a destination that soon led them up the Merrimack River. At the time, the Merrimack valley was in the midst of industrial change. As they journeyed, Henry Thoreau diligently searched for the peace and quiet of the wilderness. But the unmistakable signs of industrial transformation – the factories, cities, and railroads – intruded on his plans. This was not the path he cared to see New England take, and much of what he saw along the way disturbed him. What did the region look like when Henry Thoreau made his journey there?²

¹ Henry D. Thoreau, *The Illustrated "A Week on the Concord and Merrimack Rivers"* (Princeton, N.J., 1983), xx, 15 (references to the gazetteer appear on pp. 115, 196, and 245); William Howarth, ed., *Thoreau in the Mountains: Writings by Henry David Thoreau* (New York, 1982), 206; Henry D. Thoreau, *Journal*, ed. John C. Broderick et al., 2 vols. (Princeton, N.J., 1981), 1:124–5.

² The following description is based on contemporary accounts of the land and water-

When they left home, the Thoreau brothers ventured about seven miles down the Concord River past its marshes and meadows. They stopped in Billerica, where they found a small piece of rising ground and pitched their tent for the night.³ The next day, Henry and John left the Concord River, passing through the Middlesex Canal into the Merrimack River. They rushed through the canal in less than an hour. After spending a day lolling in the Concord, enjoying its broad expanse of meadows and its button bushes off to the side, the Middlesex Canal – built by practical-minded Yankees and so clearly artificial – annoyed Henry Thoreau.⁴

It struck Thoreau how easily they passed from the Concord to the Merrimack: “It seemed a strange phenomenon to us that the two rivers should mingle their waters so readily, since we had never associated them in our thoughts.”⁵ The two rivers indeed offered a stark contrast. Compared with the sedate waters of the Concord River, which Thoreau described as a “dead stream,”⁶ the Merrimack’s waters were far more powerful, tumbling at one point more than fifty feet in half a mile. By 1839, industry had reared itself on the Merrimack River as it never would on the Concord. A glance east from the Middlesex Canal proved the point. Perched along the shore of the Merrimack, and dependent on the river for its livelihood, was a flourishing city of about twenty thousand people. Here the river bent sharply north, then south, with a level plain set in the bend – a perfect surface for a city.⁷

Brick buildings hovered over a network of canals that cut the land into angular patches. Arranged neatly in clusters, the buildings looked nearly the same, a sea of uniformity broken occasionally by the bell towers that marked off one complex from the next. Everything here seemed set in motion, the air thick with progress. And water, the flow of the Merrimack, was at the heart of it all.

Water was forced into the canals by a masonry and wood dam that spanned one thousand feet across the Merrimack River.⁸

scape, company records, Thoreau’s own descriptions, and secondary sources that describe the physical features of the Merrimack valley.

³ Thoreau, *Journal*, 1:134.

⁴ Thoreau, *A Week*, 62.

⁵ *Ibid.*, 80.

⁶ *Ibid.*, 61.

⁷ Margaret T. Parker, *Lowell: A Study of Industrial Development* (New York, 1940), 66.

⁸ Peter M. Molloy, ed., *The Lower Merrimack River Valley: An Inventory of Historic Engineering and Industrial Sites* (Washington, D.C., 1976), 80–1.

As the water traveled through this complicated system of canals, it was at times diverted into the basements of the brick mill buildings. Concealed below ground were large wheels with buckets attached to their rims; as water filled each bucket, the weight made the wheels turn slowly.⁹ The wheels were connected to a system of belts, shafts, and pulleys that dispatched power up several floors and across their ceilings. Belts hanging from the ceiling were linked to machinery that spun cotton yarn and wove cloth from the yarn. The process was simplicity itself: water, gravity, and then power and production.

Twenty-eight mills worked here on several hundred acres of land. Six days a week, the noise of about 150,000 spindles and close to 5,000 looms could be heard across the land. The mills were driven by a massive hydraulic apparatus designed with the single-minded purpose of controlling water for production. The factories employed about eight thousand people – three-fourths of whom were women – and produced roughly 50 million yards of cloth each year, including sheetings, calicoes, broadcloths, carpets, and rugs.¹⁰ This was hardworking, calculating Lowell, Massachusetts – and this was a place Thoreau and his brother chose not to visit. Instead, after leaving the Middlesex Canal, the two pointed their boat upstream, away from the city. They rowed hard against the river's current and, in a symbolic way, against the social currents of the time.¹¹ But Thoreau, appalled by the progress represented by Lowell, would be further disappointed as he made his way up the river.

Upstream the river looked wide and the banks steep, features conducive to storing the water that drove the mills below. Above and beyond the banks lay the small hills and fertile terrain of Dracut and Chelmsford, both of deeply rural character. Although industry had settled on the Merrimack, vast stretches of the valley were still devoted to agriculture. But the signs of industry were never far off. It was not happenstance that caused the level of the water to appear rather high up the banks at this point. Indeed, the two brothers rowed in water that was part of an eighteen-mile stretch raised by the dam at Lowell.

⁹ Patrick M. Malone, *Canals and Industry: Engineering in Lowell, 1821–1880* (Lowell, 1983), 3, 5.

¹⁰ John Hayward, *The New England Gazetteer Containing Descriptions of All the States, Counties and Towns in New England*, 2d ed. (Concord, N.H., 1839), unpaginated, see under Lowell, Mass.

¹¹ This point is made in Linck C. Johnson, "A Natural Harvest: The Writing of *A Week on the Concord and Merrimack Rivers*, with the Text of the First Draft" (Ph.D. diss., Princeton University, 1974), 231.

Where once a canal was needed to pass by the Wicasee Falls in Tyngsborough, now a level expanse of water had buried the falls.¹²

The dam at Lowell did more than raise the river's water. Examining the Merrimack upstream from the dam, Thoreau contemplated progress's price: "Shad and alewives are taken here in their season, but salmon, though at one time more numerous than shad, are now more rare. Bass, also, are taken occasionally; but locks and dams have proved more or less destructive to the fisheries."¹³

That night they camped under oak trees in Tyngsborough at a point where the Merrimack broadened out, making the water appear placid, almost listless.¹⁴ They made a fire and ate their dinner. Drifting off to sleep, Henry Thoreau recalled how far they had come, from the serene wilds of Concord River to the bustling Merrimack: "Instead of the Scythian vastness of the Billerica night, and its wild musical sounds, we were kept awake by the boisterous sport of some Irish laborers on the railroad, wafted to us over the water, still unwearied and unresting on this seventh day."¹⁵

They awoke the next morning and, leaving Massachusetts behind, came into New Hampshire. They approached the village of Nashua, built at the confluence of the Nashua and Merrimack rivers. In 1839, the village had roughly six thousand people and two textile companies operating five cotton mills.¹⁶ The mill buildings were virtually identical to those found in Lowell, about 150 feet long, 45 feet wide, and four to six stories high.¹⁷ A canal three miles long, 35 feet wide, and 6.5 feet deep carried water to the mills of the Nashua Manufacturing Company, where it fell roughly 30 feet.¹⁸ Massive waterwheels, 30 feet in diameter, received the water, the lifeblood of the facto-

¹² John Warner Barber, *Historical Collections, Being a General Collection of Interesting Facts, Traditions, Biographical Sketches, Anecdotes, & c. relating to the History of Antiquities of Every Town in Massachusetts, with Geographical Descriptions* (Worcester, Mass., 1839), 375, 386; Molloy, *Lower Merrimack River Valley*, 81; Mary Stetson Clarke, *The Old Middlesex Canal* (Melrose, Mass., 1974), 106.

¹³ Thoreau, *A Week*, 88.

¹⁴ Thoreau, *Journal*, 1:136.

¹⁵ Thoreau, *A Week*, 115-16.

¹⁶ U.S. Census of Population, 1840.

¹⁷ Hayward, *New England Gazetteer*, see under Nashua, N.H.

¹⁸ Treasurer's and Annual Reports, 1825-56, AB-1, NMC Papers, BL. Hayward's *New England Gazetteer* offers conflicting figures for canal width and depth of sixty and eight feet, respectively.

ries.¹⁹ The Jackson Manufacturing Company's canal was half a mile long with 20 feet of water available to drive its two mills.²⁰ Seeing the mouth of the Nashua "obstructed" by these factories, Thoreau and his brother did not dally there. Instead, they rowed on as the sun began to set, looking for a place to spend the night. They settled on a site near Penichook [Pennichuck] Brook, a short stream flowing into the Merrimack from the west, and spread out beneath some pine trees.²¹

A thick fog enveloped them the next morning. Passing the mouth of Penichook Brook without noticing it, they squeezed upstream between the towns of Merrimack and Litchfield. No villages were in sight, just woodland and pasture interspersed with occasional fields growing corn, rye, or maybe some English grass.²² Sometime before noon, they ascended Cromwell's Canal, a short canal with only one lock, having waited for several other boats to pass through.²³ These boats might have been carrying cords of wood, bricks, or potash, common items sent downstream, through the Middlesex Canal, and on to Boston. Boats sailing upstream hauled cotton, grown in the South and shipped to Boston, machine parts, and even entire textile machines, some so wide that mill agents worried whether they would fit through the canals' locks.²⁴

A while later, they stopped to rest on an island before continuing on to Moore's Falls.²⁵ At the falls, they entered the Union Canal, a series of seven locks, encompassing six falls in the course of nine miles.²⁶ As they disappeared upstream, the bustle of Nashua and Lowell seemed more remote than ever. Before sunset they entered the canal at Coos Falls and stopped for the night in Bedford, on the river's west side.²⁷ There a rural expanse appeared before them, a reminder of agriculture's continued place in the valley.²⁸

¹⁹ Treasurer's and Annual Reports, 1825–56.

²⁰ Hayward, *New England Gazetteer*, see under Nashua, N.H.

²¹ Thoreau, *A Week*, 162, 171.

²² *Ibid.*, 192, 194.

²³ *Ibid.*, 196, 200; Christopher Roberts, *The Middlesex Canal: 1793–1860* (Cambridge, Mass., 1938), 129.

²⁴ The letters of Oliver Dean, agent of the AMC in Manchester, N.H., describe what was carried on the river: See Oliver Dean, Outgoing Correspondence, 1826–31, box 1, vol. 1, AMC Papers, MHA.

²⁵ Thoreau, *A Week*, 222.

²⁶ *Ibid.*, 231; Roberts, *Middlesex Canal*, 129.

²⁷ Thoreau, *A Week*, 234; *idem*, *Journal*, 1:136.

²⁸ Hayward, *New England Gazetteer*, see under Bedford, N.H.

Proceeding upstream, the Thoreau brothers rowed hard the next day past Cohas Brook and then surmounted Goff's, Short, Griffin's, and Merrill's falls. Ahead the river dropped a sharp fifty-four feet within half a mile, while several islands of varying dimensions sat unperturbed below the falls. The falls here were called Amoskeag, after the Indian word for fishing place.²⁹ Large rocks scattered about the river obstructed the passage of fish, making this the most noted spring fishery on the river. Fishermen laid claim to these rocks, leaning off them to snag fish in the water below.³⁰ We can imagine the summer sun beating down on the rocks when the Thoreau brothers arrived. They were probably deserted after the end of the spring fishing season, and with the river's stock of fish declining, these rocks would one day be permanently abandoned.

A little further downstream, Henry Thoreau and his brother prepared to enter the Amoskeag Canal around the falls. At the time, the area around Amoskeag Falls was under construction, a sign of impending industrial development. On the east side of the falls, a stone dam, planned to average eight feet in height in one section and thirty-four feet high in another, was being built.³¹ Surrounded by the din of workmen building, Henry Thoreau made "haste to get past the village here collected, and out of hearing of the hammer which was laying the foundation of another Lowell on the banks."³²

The new industrial city of Manchester was being built here. When the two brothers arrived in the summer of 1839, the Amoskeag Manufacturing Company, owner of much of the land in sight, had completed a power canal about a mile in length and was working on another in order to operate a system of water control much like the one at Lowell. It had one cotton mill in partial operation and another one nearly finished. It had laid out streets, mill yards, and boardinghouses, and had nearly completed a dam across the river.³³ From such modest begin-

²⁹ Dena F. Dincauze, *The Neville Site: 8,000 Years at Amoskeag, Manchester, New Hampshire* (Cambridge, Mass., 1976), 1.

³⁰ George E. Burnham, "Amoskeag's Old Fishing Rocks," *Manchester Historic Association Collections* 4 (1908): 60-7; Myron Gordon and Philip M. Marston, "Early Fishing Along the Merrimack," *New England Naturalist*, Sept. 1940, 3-4.

³¹ The figures are from Directors' Records, 4 Mar. 1837, vol. A-2, AMC Papers, BL. The papers of the AMC are divided between BL and the MHA.

³² Thoreau, *A Week*, 245.

³³ Treasurer's Report, 1 July 1839, vol. AD-1, AMC Papers, BL.

nings, Manchester would rise to prominence as New Hampshire's most impressive textile city.

The Thoreau brothers meanwhile moved on toward Hooksett, their final destination by water. There, on the east bank, they found a quiet corner of the river to leave their boat and proceeded by foot or stage for the next week.³⁴

On 5 September, they walked ten miles to Concord, New Hampshire, and from there went by coach to Plymouth. The two brothers spent the next four days hiking through the White Mountains and visiting its sites before riding back to Concord, New Hampshire, on 11 September 1839. They went to Hooksett the next day, picked up their boat, and set off downstream. The towns must have passed by in a blur: Hooksett, Manchester, Bedford, and finally Merrimack, where they stopped for the night. The following day they retraced their path to the Middlesex Canal and reached their home in Concord, Massachusetts, on 13 September.³⁵ "We had made about fifty miles this day with sail and oar," wrote Thoreau, "and now, far in the evening, our boat was grating against the bulrushes of its native port, and its keel recognized the Concord mud."³⁶

Although their vacation had come to an end, the trip lived on in Henry Thoreau's mind. In 1849, he immortalized the vacation when he published *A Week on the Concord and Merrimack Rivers*. Thoreau did not write a complete account of their voyage. Rather, the book has a rambling, philosophical tone, with much to say about the natural world. Among Thoreau's chief concerns are nature's timeless, eternal qualities. Scattered among the pages are references to nature's enduring features, to its vigor and perseverance despite what its foes, farmers and industrialists alike, had done.³⁷

But one wonders about nature's supposed immortal qualities, especially in the face of formidable industrial transformation. As Thoreau struggled to write the book in the 1840s, industry proceeded apace. The landscape he viewed in 1839 had been radically altered by the time the book appeared. Indeed, in the ten years it took Thoreau to publish his thoughts, the textile city of Lawrence, Massachusetts, had gone up along the river's

³⁴ Thoreau, *A Week*, 291; idem, *Journal*, 1:136-7.

³⁵ Thoreau, *Journal*, 1:136-7.

³⁶ Thoreau, *A Week*, 393.

³⁷ See, e.g., *ibid.*, 34, 62.

shores as industry continued to change the look of the Merrimack valley. A river that had once flowed triumphant and unimpeded across New England had slowed to an industrial pace – a development Thoreau lamented. When Thoreau revisited southern New Hampshire nine years after his original voyage, he noted the extension of the railroad, the rapidly growing population, and the relentless tide of industry and how it had transformed the river valley.³⁸ In Thoreau's words, "Instead of the scream of a fish-hawk scaring the fishes, is heard the whistle of the steam-engine arousing a country to its progress."³⁹

If Thoreau found industry's imprint on New England's landscape unwelcome, he was no more heartened by what the region's farmers had done. In his eyes, Yankee farmers had already played havoc with the land, tromped all over it, fenced it where they pleased, planted orchards and market gardens, and ruined a once fertile New England soil. Their pockets interfered with their better judgment, causing them to treat the land insolently. According to Thoreau, the commercial economy had made matters worse for farmers. It urged them on a reckless tear through the land, chopping down trees, plowing up the soil, reclaiming meadows – all in a desperate attempt to seize whatever economic opportunity the market offered. Even before the factories arrived, the nineteenth-century New England landscape seemed poisoned to Thoreau, the victim of the unsurpassed greed of a market-oriented people.

The world, Thoreau believed, had not always been this way. He consoled himself with thoughts of preindustrial life in which farmers worked the land to satisfy only themselves and not the demands of the market. He romanticized life in former times, imagining a world of economic self-sufficiency, of lives filled with meaningful work and divinity.⁴⁰ Life before the Europeans arrived seemed even better to him. The Indians who lived on the land respected nature, cherishing a land that white settlers took for granted. Throughout *A Week*, Thoreau inquires into the fate of these people, sympathizing with them,

³⁸ Ibid., xvii, 245. The population of Manchester, N.H., had grown from 3,235 in 1840 to 13,932 ten years later. See U.S. Census of Population, 1840, 1850.

³⁹ Thoreau, *A Week*, 87.

⁴⁰ Thoreau's views on agriculture and the economy of New England are discussed in Robert A. Gross, "The Great Bean Field Hoax: Thoreau and the Agricultural Reformers," *Virginia Quarterly Review* 61 (1985): 483–97, esp. 490–1; idem, "The Most Estimable Place in All the World': A Debate on Progress in Nineteenth-Century Concord," *Studies in the American Renaissance* 2 (1978): 1–15.

for they were the antithesis of progress, the epitome of harmonious relations with the New England soil.⁴¹

Thoreau sought a world long gone in 1839. European colonization had obliterated Native American culture, spreading diseases unknown to the Indian immune system and imposing another set of environmental values and behaviors on the landscape. As the eighteenth century progressed, the marks of European culture became more firmly entrenched on the land: Rye, oats, and English hay were planted, swine and cattle were grazed, and the most visible manifestation of European settlement appeared – the stone fence. A new European ecological pattern had conquered its Indian predecessor. But this too was passing. And some day, the stone fences that set one field off from another would run through new-growth forests, serving as subtle reminders of New England's agricultural past. As forests would encroach on the weed-strewn fields, long since given up, another ecological transformation would begin.⁴²

When Thoreau made his first journey through New England, he saw signs of all these environmental patterns – the Indian's occupancy, the white man's agriculture, and the new industrial regime. Agriculture still dominated much of the land as well as the lives of many of its inhabitants. Yet agriculture was being pushed aside at points to accommodate the new urban-industrial stirrings. The pages that follow look at what is perhaps the best-known aspect of New England's industrial transformation: the emergence of the Waltham-Lowell system. Francis Cabot Lowell's Waltham experiment on the Charles River and the later founding of Lowell, Massachusetts, are part of almost every textbook treatment of early American industry. A group of New England entrepreneurs known collectively as the Boston Associates, with the help of a corps of expert mechanics and engineers, were the architects of the Waltham-Lowell mills. They were responsible for a number of technological and labor innovations that made large-scale production of cotton textiles a flourishing industry in nineteenth-century New England.⁴³

⁴¹ Johnson, "Natural Harvest," 222–3, 247–8.

⁴² William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York, 1983), 156.

⁴³ For an early account of the rise of the Waltham-Lowell system, see Caroline F. Ware, *The Early New England Cotton Manufacture: A Study in Industrial Beginnings* (Boston, 1931).

This is a familiar story, one told by historians for some time now.⁴⁴ Much of the attention has focused on the legendary textile city of Lowell. Early works concentrated on such diverse topics as technological change, industrial architecture, and labor relations. More recent works have explored the intellectual and cultural responses to industrial growth in this great urban center. Some have studied textile and waterpower technology, while others have examined the city's immigrant communities. Business historians have explored the Boston Associates' plans for the founding and design of the city. Issues of gender, class, family, and work, topics of concern to social historians, have also been investigated. In all, the range of subjects and approaches is impressive.⁴⁵

Still, an important part of this story remains untold. Nature has tended to be excluded from the history of industrial transformation. The natural world has been there all along, but historians have largely neglected it. One of the points of this study is to show just how important nature – in this case water – was to the industrial and urban history of New England. History is forever being written and rewritten. And no claims are

⁴⁴ The tremendous attention paid to the Waltham–Lowell mills has prompted some to question whether our understanding of industrialization has been skewed. Indeed, most textile mills built in nineteenth-century New England were not based on the Waltham–Lowell model. Most relied on a more diverse set of laborers who found their housing throughout the community, not in boardinghouses common in Lowell. The mills existed on small amounts of capital and were often run by at least some of their owners. They managed to meet their needs with small quantities of waterpower and were commonly found in southern New England. See Jonathan Prude, *The Coming of Industrial Order: Town and Factory Life in Rural Massachusetts, 1810–1860* (Cambridge, 1983), xiv–xv.

⁴⁵ See George S. Gibb, *The Saco-Lowell Shops: Textile Machinery Building in New England, 1813–1949* (Cambridge, Mass., 1950); John P. Coolidge, *Mill and Mansion: A Study of Architecture and Society in Lowell, Massachusetts, 1820–1865* (1942; reprint, New York, 1967), and the discussion of labor in Lowell in Norman Ware, *The Industrial Worker, 1840–1860: The Reaction of American Industrial Society to the Advance of the Industrial Revolution* (1924; reprint, Chicago, 1964); Thomas Bender, *Toward an Urban Vision: Ideas and Institutions in Nineteenth Century America* (Baltimore, 1975); John F. Kasson, *Civilizing the Machine: Technology and Republican Values in America, 1776–1900* (New York, 1976); David J. Jeremy, *Transatlantic Industrial Revolution: The Diffusion of Textile Technologies Between Britain and America, 1790–1830s* (Cambridge, Mass., 1981); Louis C. Hunter, *Waterpower in the Century of the Steam Engine, A History of Industrial Power in the United States, 1780–1930*, vol. 1 (Charlottesville, Va., 1979); Brian C. Mitchell, *The Paddy Camps: The Irish of Lowell, 1821–61* (Urbana, Ill., 1988); Robert V. Spalding, "The Boston Mercantile Community and the Promotion of the Textile Industry in New England, 1813–1860" (Ph.D. diss., Yale University, 1963); Robert F. Dalzell, Jr., *Enterprising Elite: The Boston Associates and the World They Made* (Cambridge, Mass., 1987); and Thomas Dublin, *Women at Work: The Transformation of Work and Community in Lowell, Massachusetts, 1826–1860* (New York, 1979).

made here to have documented the definitive story behind industrial change. But a rather different way of understanding industrialization will be offered: an environmental approach.

New England's productive output expanded as new technologies were manipulated and applied to the region's available natural resources. The natural world came to represent new sources of energy and raw materials. Nature was perceived more and more as a set of "inputs" central to the productive capacity of the economy. The broadening of New England's industrial base allowed more products to be manufactured. But this leap in productive capacity also meant a change in how people understood and made use of the environment around them. The burden of this study is to show that industrial capitalism is not only an economic system, but a system of ecological relations as well.

In a sense, the environmental perspective proposed here is a counterpart to the work of social historians. They view industrialization as a transformation in social relations, in people's interactions with one another. But if industrial transformation affected such aspects of social life as class, gender, and family relations, it also altered human relations with the natural world. A close connection exists between the way a culture tends to its natural resources and the way it employs its human resources.⁴⁶ In this book, I will look at how people reshaped the natural world, how they transformed their relationship with nature to generate economic growth.

Environmental history is a new field of study. Its central task is twofold: to examine how the environment has shaped human cultures over time and to understand the effects of human activity on nature itself. Very simply, environmental historians want to make sense of the role that the natural world has played in the historical process. How did the natural order affect how history was made? What impact did human-induced changes have on the environment, and how did such changes limit the possible paths that history could take?⁴⁷

A number of approaches and assumptions inform the work

⁴⁶ See Maurice Godelier, *The Mental and the Material: Thought Economy and Society*, trans. Martin Thom (London, 1986), 121.

⁴⁷ For an introduction to the field, see Donald Worster, "History as Natural History: An Essay on Theory and Method," *Pacific Historical Review* 53 (1984): 1-19. The field's historiography is reviewed in Richard White, "American Environmental History: The Development of a New Historical Field," *ibid.*, 54 (1985): 297-335.

now being done in this field. For me, one assumption is absolutely central: Human history is defined by the transformation and control of nature. The progressive reworking of the natural world to suit human needs and desires has been a constant throughout our history on this planet. As the anthropologist John Bennett writes, humankind's relationship with the environment "has featured a growing absorption of the physical environment into the cognitively defined world of human events and actions."⁴⁸ To one degree or another, nature has always been incorporated into human cultures. The point is to understand this phenomenon historically. The emergence of industrial capitalism, I will show, marked a new stage in this continuing process, one in which nature has been more thoroughly defined in anthropocentric terms. Industrial expansion involved a profound restructuring of the environment – a far more comprehensive incorporation of nature into the human agenda than ever existed before. At its core, the process entailed a systematic effort to control and master nature, a development that had dramatic implications for both human beings and the environment itself.

New England's rivers and streams, with their abundance of waterpower, provide an important place to observe this historical process. Carving their way through the land, the region's rivers, with their relatively high average slopes and frequent falls, were perfect for America's early industrial development. The Boston Associates poured capital into a long list of New England river valleys, but only two will be singled out for study here. The rise of the Waltham–Lowell system began along the Charles River in Waltham. As the nineteenth century progressed, the ambitions of the Boston Associates outgrew the modest waterpower of the Charles. The search began for more substantial sources of energy, and before long the well-endowed water resources of the Merrimack River were tapped. The textile cities of the Merrimack valley – Lowell, Lawrence, Nashua, and Manchester – controlled water to an unparalleled

⁴⁸ John W. Bennett, *The Ecological Transition: Cultural Anthropology and Human Adaptation* (New York, 1976), 4. My environmental perspective on history borrows from the fields of economic and ecological anthropology, particularly the contributions of Karl Polanyi, Roy Rappaport, Marvin Harris, Richard Lee, Maurice Godelier, and Marshall Sahlins. On anthropological theory and industrial change, see Theodore L. Steinberg, "An Ecological Perspective on the Origins of Industrialization," *Environmental Review* 10 (1986): 261–76.